8-22 $\lambda = 632.8\,nm$

a) $E_{per\,photon} = h\nu = \frac{hc}{\lambda} = \frac{4.136\times10^{-15}\cdot 3\times10^{8}\,m/s}{632.8\times10^{-9}\,m} = 1.96\,eV/photon$

$Power = \frac{E}{T} = 3.5\times10^{-3}\,J/s = 2.18\times10^{16}\,eV/s$

So we have $\frac{2.18\times10^{16}\,eV/s}{1.96\,eV/photon} = 1.11\times10^{16}\,photons/second$

b) From 3.8 $\langle P\rangle = \frac{1}{\mu_0 c} E_0^2 A \frac{1}{2}$ $= 3.5\times10^{-3}\,J/s$

$A = \pi\left(\frac{d}{2}\right)^2 = \pi(1.2\times10^{-3})^2$

$= 4.5\times10^{-6}\,m^2$

$E_0^2 = \frac{2\cdot 3.5\times10^{-3}\cdot \mu_0 c}{A}$

$= \frac{7\times10^{-3}\cdot(4\pi\times10^{-7})(3\times10^{8}\,m/s)}{4.5\times10^{-6}\,m^2}$

$= 5.86\times10^{6}$

$E_0 = 765.8\,N\,m^2/Coulomb$